

method of tanning analysis are given. The subsequent chapters deal with the estimation of colour in tanning materials, the analysis of used tan-yard liquors, the analysis of alum and chrome. In connection with this last-named subject the author gives some valuable practical information on the making up of chrome liquors in the testing of liquors in use. This branch of leather manufacture has progressed by enormous strides during the past ten years.

The next chapters deal with the estimation of adulterants in leather, the analysis of soaps, oils and fats, and a table of important constants for oils and fats used in the leather trade is given, and the effect of various fats on leather explained. The analysis of leather, dyes and dye-stuffs follows. The last three chapters are devoted to the use of the microscope, the structure of the skin, and bacteriology. These have been largely re-written, and the author has added some fine photomicrographs of adulterants in tanning materials, and indicates the value of the use of the microscope in competent hands. The bacteriology and mycology of tanning is gone into thoroughly, and our somewhat scanty information on this subject brought up to date, the rapid growth of our knowledge of this most important branch being made evident.

The work is illustrated and printed on good paper, and is written in Prof. Procter's well-known clear style.

At the end of the book some blank leaves are bound in, so that pending the arrival of the third edition those using this book may add notes, and so keep the volume up to date. With such a volume as this before us one is almost tempted to say that after all science has secured a firm foothold in one of the most conservative trades existent.

J. GORDON PARKER.

OUR BOOK SHELF.

Geology and Mineral Resources of the Western Coal-field. By J. E. Carne. Pp. xii+264; with 37 plates and portfolio of maps and sections. (Sydney: Geological Survey of New South Wales, 1908.) Price 15s.

IN New South Wales the existence of beds of coal was known in very early days, and was the reason for the name of the colony. It is calculated that New South Wales has yielded altogether 138½ million tons of coal, the output last year alone having exceeded 8½ million tons. In addition to coal, the kerosene shale deposits are of considerable importance, and are at present attracting attention owing to the introduction of British capital for their development. Mr. Carne's elaborate monograph, which reflects great credit upon himself and upon the Geological Survey, is consequently a work of the utmost importance to the mining industry, as well as a valuable addition to scientific literature. With the accompanying portfolio of coloured geological maps and sections, it forms the first instalment of a systematic geological survey of the productive Permian-Carboniferous Coal-measures of New South Wales. The total area mapped and described in this memoir amounts to 2877 square miles, of which 2261 square miles may be regarded as productive. The country described embraces the principal parts of Cook and

Hunter counties, and a large portion of Roxburgh and Phillip counties, the greater part of the Blue Mountains being included. From an economic point of view, coal and kerosene-shale are the chief assets of the country mapped. Limestone, firebrick, pottery clays, building stones, and iron ore follow in order. The smelting of local iron ore has been successfully begun at Lithgow; and if the iron-smelting venture and the extensive development of the kerosene-shale export and retorting industry continue to progress, the district will soon become a great centre of industrial activity. The picturesque character of the country is well shown in the numerous admirable illustrations accompanying the memoir. Massive Triassic sandstone, imparting boldness to the scenery, is sculptured by denudation into rugged walls and isolated masses. Irregularities of the plateau are not less varied. Huge domed laccoliths, conical volcanic peaks, and flat coulees remnants are everywhere prominent. A glance at the illustrations impresses one with the magnitude of the task of geologically surveying these mountains, which in 1788 effectually barred Governor Phillip's progress into the interior from the settlement on the shores of Port Jackson. The persistence of the explorer of the present day in forcing his way along jungle-fringed and boulder-strewn streams flowing through deep cañons and almost impassable ravines is hardly less astonishing than that of the first surveyors, who, far from an accessible base of supplies, traversed this unknown and inhospitable region.

Science and Empiricism. By H. C. Daniel. Pp. 29. (London: Scientific Press, Ltd., 1908.) Price 1s. 6d. net.

THIS booklet contains a strange medley of fact and fiction, though apparently written with a good motive, for in his preface the author acknowledges the "splendid efforts of our scientists and medical professors," and deplors "the neglect of hospitals and laboratories." In section i. the author discourses on biology and Weismannism; in section ii. on pathology, with special reference to cancer and its cure, in which we are exhorted "in the place of fiction to substitute truth. Instead of holding to the absurd principle that the red corpuscles are the bearers of oxygen, let us in the future build upon the more scientific principle that oxygen is the bearer of the red corpuscles." Cancer is easily explained. "Superficial cancer is a disease of the blood tissues and is only dangerous in so far as it affects the tissues or envelope of life. Plasmic cancer, however, is a disease of the oxygen or vital ground, that is to say, of the white corpuscles or physical unity of life, and as such it goes deeper than the tissues." The seven last pages are devoted to sections on theology, education, and government, but what they are all about we really are not quite sure!

R. T. H.

Vegetationsbilder. Edited by G. Karsten and H. Schenck. Sixth Series. Part i., Samoa. By Karl Rechinger. Part ii., New Guinea Archipelago. By Karl Rechinger. Part iii., North-Eastern Brazil. By E. Ule. Part iv., The Algerian Sahara. By H. Brockmann Jerosch and A. Heim. Parts v. and vi., Alpine Vegetation. By H. Schenck. (Jena: Gustav Fischer, 1908.)

THE sixth series of the "Vegetationsbilder" fully maintains the reputation of the preceding volumes. The pictures of Samoan vegetation furnish an indication of the humidity of the climate where ferns supply 25 per cent. of the higher plants. Illustrations are provided of *Polypodium sabauriculatum*, an epiphyte in the rain forest, *Angiopteris evecta*, growing by the streams, and *Todea Fraseri*, an

endemic species of the genus, also of a peculiar liliaceous epiphyte, *Astelia montana*. As characteristic plants of the Solomon Islands there are figured the epiphyte *Polypodium quercifolium*, an expanse of "alang-alang" grass, *Imperata arundinacea*, and a huge specimen of *Calophyllum inophyllum* growing close to the sea. A fine photograph of the stilt-roots of a *Ficus* is contained in this part. Mr. E. Ule has contributed the photographs from the "campos" in the Brazilian State of Bahia. Various cactus plants are illustrated, also some of the abundant leguminous trees. The cluster of palms, *Copernicia cerifera*, the species yielding Carnauba wax, forms an imposing group. The number devoted to the Algerian Sahara is also a xerophytic study. The plates include representations of *Limoniastrum Feei*, *Aristida pungens*, and *Pistacia terebinthus*. In the final double number Dr. Schenck presents some excellent studies of plants in the Swiss and Tyrolean Alps. The photographs that more particularly evoke admiration are those showing cushions of *Androsace helvetica*, flowers of *Ranunculus alpestris*, clumps of *Thlaspi rotundifolia*, and straggling plants of *Salix retusa*.

British Rainfall, 1907. By Dr. H. R. Mill. Pp. 100 +[280]; with maps and illustrations. (London: E. Stanford, 1908.) Price 10s.

This excellent work, which has now reached its forty-seventh annual volume, has, by the energy and ability of its founders, established for itself a unique position among general rainfall publications. It deals with the distribution of rain in space and time over the British Isles during the year 1907, as recorded by more than 4000 voluntary observers, and is supplemented by articles upon various branches relating to that subject. As it has appeared in practically the same form for many years (which is a great advantage for the purpose of reference), there is little to be said about it that has not been previously mentioned; the work of the British Rainfall Organisation is continually expanding, and the author receives no pecuniary assistance in the onerous labour of preparation and publication of the report beyond some subscriptions from persons interested in rainfall work.

Among the articles we may specially refer (1) to an interesting discussion of the typical thunderstorms of July 21-22, showing distinctly the linear arrangement of heavy rainfall in such storms and its disregard of the configuration of the land, and (2) to an instructive note on mapping rainfall. The discussions of droughts and rain spells, and the monthly and seasonal charts illustrating the rainfall of the year, are also of exceptional interest.

Arbeiten aus dem Gebiet der experimentellen Physiologie. By Dr. Hans Friedenthal. Pp. xi+493. (Jena: G. Fischer, 1908.) Price 8 marks.

This is a collection of fifty-five papers written either by Dr. Hans Friedenthal or by the workers in his laboratory. Dr. Friedenthal does not appear to have any university or other official post, but is the happy possessor of a private laboratory at Nicolassée, near Berlin, and he seems to be a prolific and versatile worker. The first paper of the collection is an obstetric one, written in 1894, but subsequently the various branches of physiological investigation appear to have had greater attraction for him, and he has produced since that time publications dealing with such subjects as absorption, immunity, digestion, colloids and ions, cardiac and sympathetic nerves, cancer, syphilis, the urine, and histological methods. The papers themselves are of considerable interest, and the collection is one of which any investigator may well be proud.

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LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Observations on the Active Deposit of Radium in Mid-ocean.

IN the month of May, 1908, by the kindness of the captain and officers of the ss. *Lake Erie*, observations were made between Montreal and Liverpool on the radio-active matter collected on a negatively charged wire exposed to the air for three or four hours. The wire was insulated by ebonite rods, suspended from the flag halyards, and charged by a Zamboni dry pile. After exposure it was coiled on a skeleton reel and placed in an electroscope clamped to a board, together with the observing microscope. There was no difficulty in obtaining satisfactory readings, in spite of the slight motion of the ship.

The results obtained in mid-Atlantic appear to approximate to those found in Canada or in England, but it must be remembered that the amount of active deposit determined at any given locality is liable to considerable variations.

To an arbitrary scale, after deducting the natural leak, the measurements of the active deposit were as follows:—

May 5.	Montreal	...	...	...	34
" 6.	"	...	...	...	26
" 14.	Ocean, lat. 50°, long. 45°	...	...	...	21
" 15.	" " 52° " 38°	...	...	...	64
" 16.	" " 54° " 30°	...	...	...	41
July 1.	Hornsea, E. Yorkshire Coast	...	...	...	28
" 2.	" " " "	...	...	...	80
" 15.	" " " "	...	...	...	53
" 20.	" " " "	...	...	...	60
" 22.	" " " "	...	...	...	48
Aug. 22.	Seascale, W. Coast, Cumberland	...	...	...	30
" 24.	" " " "	...	...	...	270

The large value at Seascale on August 24 was obtained on a vertical wire well exposed to a strong west wind. The small values at Montreal resulted from a horizontal wire on the roof of a house. An uncharged wire at sea gave no result.

These experiments, so far as they go, indicate that the active deposit due to radium is prevalent to nearly the same extent over land and sea. Observers have also found that the ionisation of the atmosphere, measured by Ebert's apparatus, is nearly the same over the ocean and over the land.

We may deduce, then, that in mid-ocean the radium emanation, which decays to half value in 3.8 days, and gives rise to the active deposit, cannot be entirely wind-borne from the land, but that the emanation enters the air from the ocean somewhat as from the ground.

This is contrary to expectation, for the average number of grams of radium per c.c. of rock is about 3.5×10^{-12} (Strutt) and per c.c. of sea water 3×10^{-14} (Joly). It is, however, probable that the emanation due to radium in solution in sea-water escapes more readily than the greater quantity generated in soil or rock. The emanation per c.c. in the atmosphere near the earth's surface would be in equilibrium with about 6×10^{-17} grams of radium.

Montreal, September 22.

A. S. EVE.

The Indigo Question.

IN an admirable article, "A Contribution to the Indigo Question," which appeared in NATURE of July 30 (p. 296), Prof. Meldola discusses the report of the work carried on by Messrs. Bloxam, Wood, Orchardson, Gaunt, and Thomas in the clothworkers' laboratory at Leeds University, and agrees with the authors in the opinion they express that there is still scope for considerable improvement in the manufacture of natural indigo. On the other hand, the general secretary of the Bihar Planters' Association (Mr. T. R. Filgalt), in replying to this article (NATURE, October 1), makes the remarkable statement, "nothing further can be done in improving the main processes."